

What is claimed is:

1. An organic thin film transistor, comprising a gate electrode, a gate insulating film, an organic active layer and a source/drain electrode, or a gate
5 electrode, a gate insulating film, a source/drain electrode and an organic active layer, sequentially formed on a substrate,

wherein the gate insulating film is a multi-layered insulator comprising a first layer of a high k
10 material and a second layer of an insulating organic polymer compatible with the organic active layer, the second layer being positioned directly under the organic active layer.

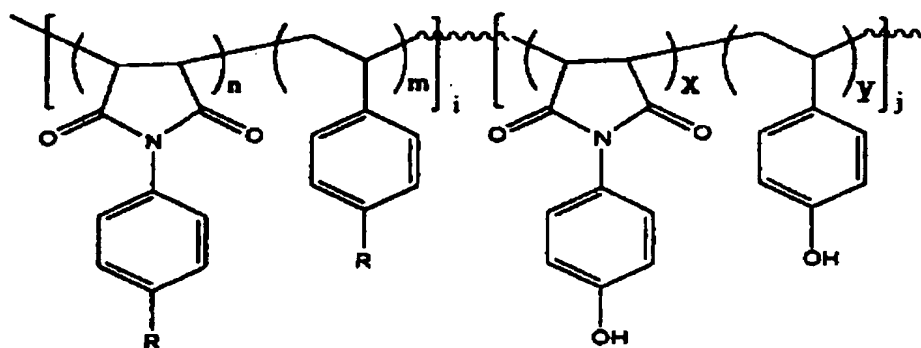
2. The organic thin film transistor of Claim 1,
15 wherein the first and the second layers of the gate insulating film are formed by a wet process.

3. The organic thin film transistor of Claim 1,
wherein the high k material for the first insulating layer is a mixture of an insulating organic polymer and
20 an organic metal compound, or a mixture of an insulating organic polymer and nanoparticles of an inorganic metal oxide or a ferroelectric insulator,

wherein the high k material has a dielectric constant(k) of 5 or higher.

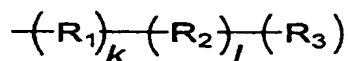
4. The organic thin film transistor of Claim 1, wherein the insulating organic polymer of the second
5 insulating layer is selected from the group consisting of polyvinylphenol, polyacrylate, polyvinylalcohol, and a polymer represented by the following Formula 1:

Formula 1



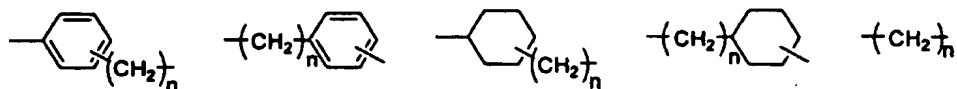
10 wherein, R is represented by the following Formula
2:

Formula 2



15 wherein R₁ is selected from the group consisting of the following groups of group A, in which n is an integer of 0 to 10:

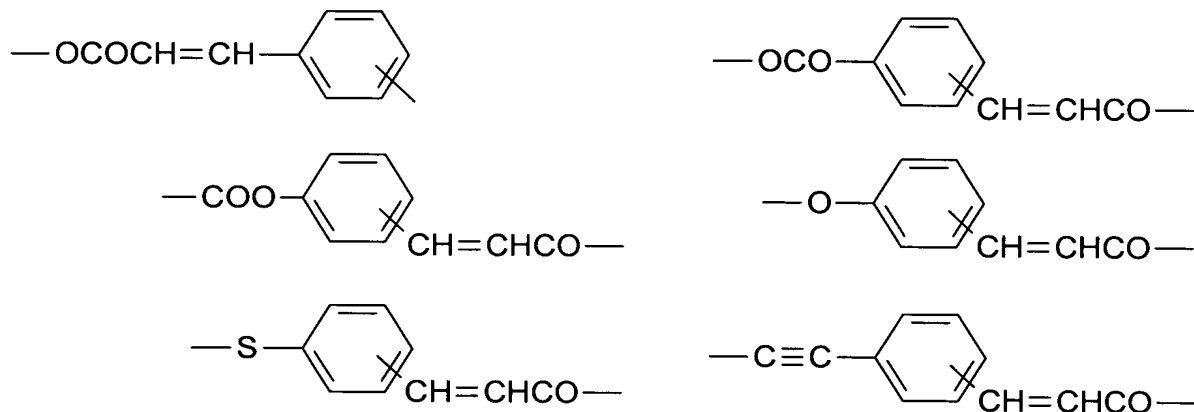
Group A



R_2 is a photo-alignment group selected from the group consisting of the following groups of Group B,
 5 provided that at least one of R_2 is selected from (I) when l is 2 or higher:

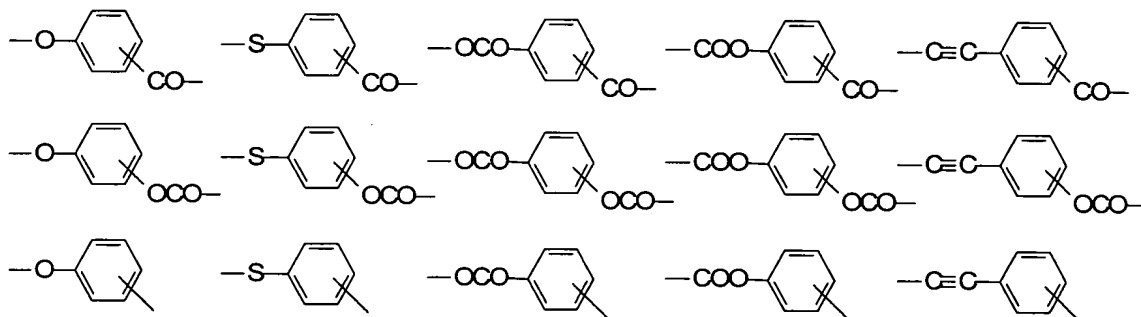
Group B

(I)



10

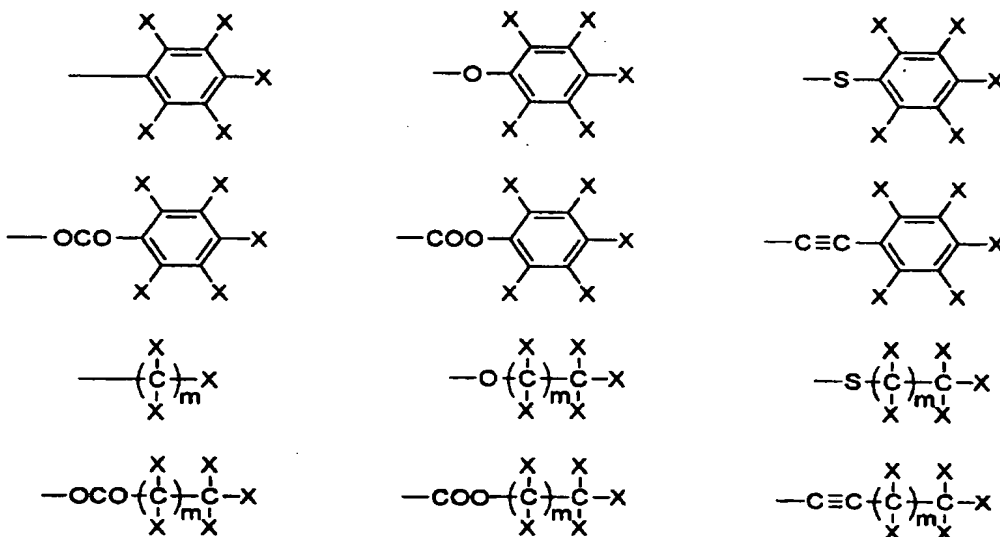
(II)



R_3 is a hydrogen atom or is selected from the group consisting of the following groups of group C, in

which X is a hydrogen atom, an alkyl or alkoxy group of 1 to 13 carbon atoms, an aromatic group of 6 to 20 carbon atoms, a hetero-aromatic group of 4 to 14 carbon atoms having at least one hetero atom contained in an aromatic ring, $-(\text{OCH}_2)_p\text{CH}_3$ wherein p is an integer of 0 to 12), F or Cl and m is an integer of 0 to 18:

Group C



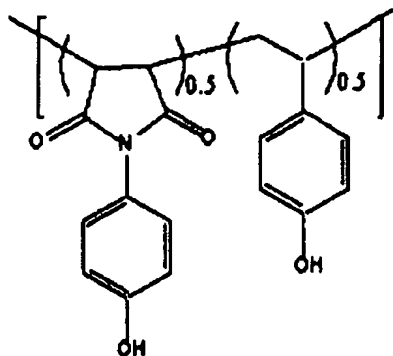
10 k is an integer of 0 to 3 and l is an integer of 1 to 5, provided that each of R₁ and R₂ can be different when k or l is 2 or higher;

m is a real number of 0.3 to 0.7, and n is a real number of 0.3 to 0.7, provided that the sum of m and n becomes 1; x is a real number of 0.3 to 0.7, and y is a real number of 0.3 to 0.7, provided that the sum of x and y becomes 1; and i is a real number of 0 to 1 and j

is a real number of 0 to 1, provided that the sum of i and j becomes 1.

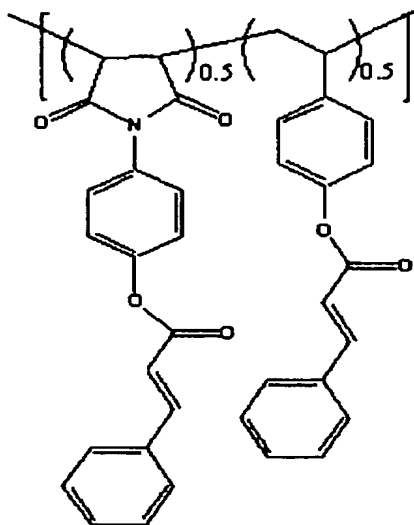
5. The organic thin film transistor of Claim 4, wherein the polymer represented by the Formula 1 is a compound represented by the following Formulas 3, 4, 5, or 6:

Formula 3

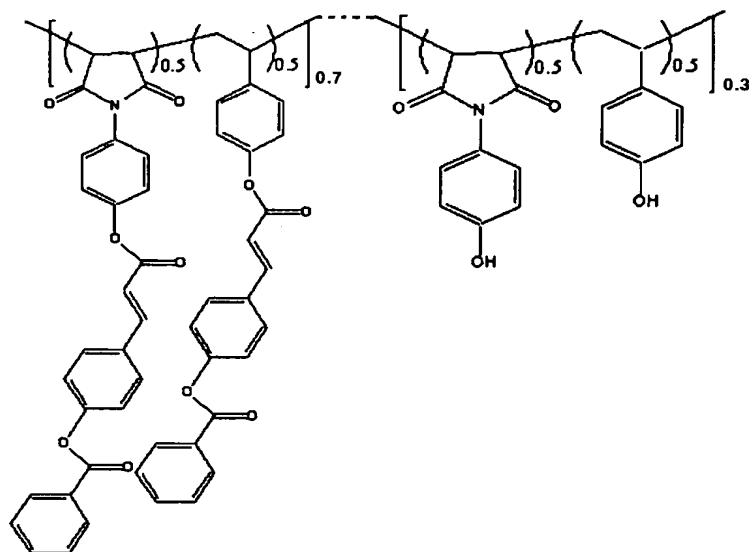


10

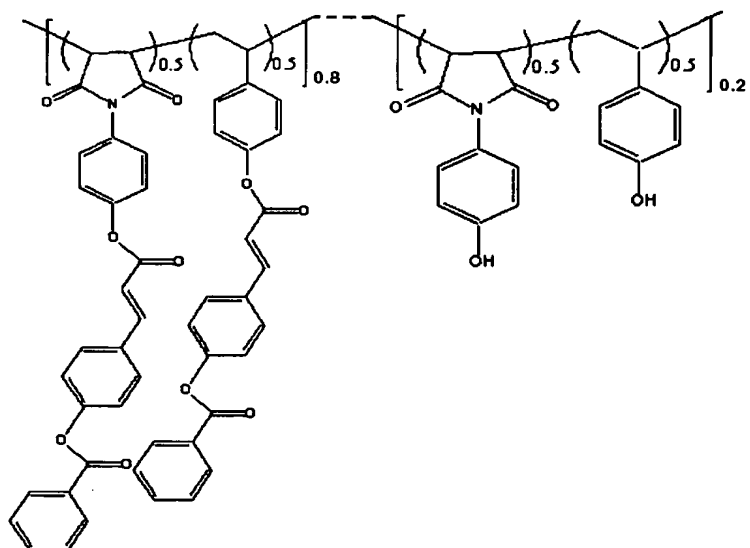
Formula 4



Formula 5



Formula 6



6. The organic thin film transistor of Claim 1, wherein the substrate is plastic, glass, quartz, or silicon substrate.

7. The organic thin film transistor of Claim 2,
5 wherein the wet process is carried out by a spin coating, a dip coating, a printing, or a roll coating method.

8. The organic thin film transistor of Claim 3,
wherein the insulating organic polymer for the first
10 layer is selected from the group consisting of polyester, polycarbonate, polyvinylalcohol, polyvinylbutyral, polyacetal, polyarylate, polyamide, polyamidimide, polyetherimide, polyphenylenether, polyphenylenesulfide, polyethersulfone, polyetherketone,
15 polyphthalamide, polyethernitrile, polyethersulfone, polybenzimidazole, polycarbodiimide, polysiloxane, polymethylmethacrylate, polymethacrylamide, nitrile rubbers, acryl rubbers, polyethylenetetrafluoride, epoxy resins, phenol resins, melamine resins, urea
20 resins, polybutene, polypentene, ethylene-co-propylene, ethylene-co-butene diene, polybutadiene, polyisoprene, ethylene-co-propylene diene, butyl rubbers, polymethylpentene, polystyrene, styrene-co-butadiene,

hydrogenated styrene-co-butadiene, hydrogenated polyisoprene, hydrogenated polybutadiene, and mixtures thereof.

9. The organic thin film transistor as defined in
5 claim 3, wherein the organic metal compound for the first layer is selected from the group consisting of titanium-based compounds, including titanium (IV) n-butoxide, titanium (IV) t-butoxide, titanium (IV) ethoxide, titanium (IV) 2-ethylhexoxide, titanium (IV)
10 isopropoxide, titanium (IV) (di-isopropoxide)bis-(acetylacetonate), titanium (IV) oxide bis(acetylacetonate), trichlorotris(tetrahydrofuran)titanium (III), tris(2,2,6,6 -tetramethyl-3,5-heptanedionato)titanium
15 (III), (trimethyl)pentamethyl cyclopentadienyl titanium (IV), pentamethylcyclopentadienyltitanium trichloride (IV), pentamethylcyclopentadienyltitanium trimethoxide (IV), tetrachlorobis(cyclohexylmercapto)titanium (IV), tetrachlorobis(tetrahydrofuran)titanium (IV),
20 tetrachlorodiamminetitanium (IV), tetrakis(diethylamino)titanium (IV), tetrakis(dimethylamino)titanium (IV), bis(t-butylcyclopentadienyl)titanium dichloride, bis(cyclopentadienyl)dicarbonyl titanium (II),

bis(cyclopentadienyl)titanium dichloride,
 bis(ethylcyclopentadienyl)titanium dichloride,
 bis(pentamethylcyclopentadienyl)titanium dichloride,
 bis(isopropylcyclopentadienyl)titanium dichloride,
 5 tris(2,2,6,6-tetramethyl-3,5-heptanedionato)oxotitanium
 (IV), chlorotitanium triisopropoxide,
 cyclopentadienyltitanium trichloride,
 dichlorobis(2,2,6,6-tetramethyl-3,5-heptane dionato)
 titanium (IV), dimethylbis(t-
 10 butylcyclopentadienyl)titanium (IV), or
 di(isopropoxide)bis (2,2,6,6-tetramethyl-3,5-
 heptanedionato)titanium (IV); zirconium- or hafnium-
 based compounds, including zirconium (IV) n-butoxide,
 zirconium (IV) t-butoxide, zirconium (IV) ethoxide,
 15 zirconium (IV) isopropoxide, zirconium (IV) n-propoxide,
 zirconium (IV) acetylacetonate, zirconium (IV)
 hexafluoroacetylacetonate, zirconium (IV)
 trifluoroacetylacetonate,
 tetrakis(diethylamino)zirconium,
 20 tetrakis(dimethylamino)zirconium, tetrakis(2,2,6,6-
 tetramethyl-3,5-heptanedionato)zirconium (IV),
 zirconium (IV) sulfate tetrahydrate, hafnium (IV) n-
 butoxide, hafnium (IV) t-butoxide, hafnium (IV)
 ethoxide, hafnium (IV) isopropoxide, hafnium (IV)

isopropoxide monoisopropylate, hafnium (IV) acetylacetonate, or tetrakis(dimethylamino)hafnium; aluminum-based compounds, including aluminum n-butoxide, aluminum t-butoxide, aluminum s-butoxide, aluminum ethoxide, aluminum isopropoxide, aluminum acetylacetonate, aluminum hexafluoroacetylacetonate, aluminum trifluoroacetylacetonate, or tris(2,2,6,6-tetramethyl-3,5-heptanedionato) aluminum; and mixtures thereof.

10 10. The organic thin film transistor as defined in claim 3, wherein the nanoparticles of the inorganic metal oxide comprise nanoparticles of Ta_2O_5 , Y_2O_3 , TiO_2 , CeO_2 , or ZrO_2 , and the nanoparticles of the ferroelectric insulator comprise nanoparticles of
15 barium strontium titanate (BST), $PbZr_xTi_{1-x}O_3$ (PZT), $Bi_4Ti_3O_{12}$, $BaMgF_4$, $SrBi_2(Ta_{1-x}Nb_x)_2O_9$, $Ba(Zr_{1-x}Ti_x)O_3$ (BZT), $BaTiO_3$, $SrTiO_3$ or $Bi_4Ti_3O_{12}$, in which the nanoparticles have diameters of 1-100 nm.

11. The organic thin film transistor of Claim 1,
20 wherein the organic active layer is made of any one selected from the group consisting of pentacene, copper phthalocyanine, polythiophene, polyaniline,

polyacetylene, polypyrrole, polyphenylene vinylene, and derivatives thereof.